

CMMI and Agile Processes:

Can't we
all just
get along?



Joe Jarzombek
OUSD(AT&L)
Software Intensive
Systems

Richard Turner
The George Washington
University
presented to

2nd CMMI Technical

Overview

- ❖ **Software development problems are ubiquitous**
- ❖ **CMMI and Agile Methods have been seen as didactic**
- ❖ **Mapping agile to CMMI elements**
- ❖ **Process maturity requirements for agility**
- ❖ **The bottom line**



*Like Alice's White Rabbit,
software always seems to
be late*

The Situation



An ambiguous vision of the SW development grail

- ❖ We're all searching for a solution to the software problem
- ❖ CMMI and process improvement attempt to ensure consistency and predictability
- ❖ Agile is a response to over-specified processes and dehumanization
- ❖ Misunderstanding abounds

Comparing CMMI and Agile Characteristics

General Characteristics

❖ **Primary goals**

- ❖ **Predictability, Stability, high assurance**
- ❖ **Customer satisfaction, Speed**

❖ **Scope**

- ❖ **Broad, Inclusive and Organizational**
- ❖ **Small, Focused**

❖ **Improvement focus**

- ❖ **Process**
- ❖ **People**

❖ **Motivation**

- ❖ **Both want to develop high performance organizations**

Comparing CMMI and Agile Characteristics

Management Characteristics

❖ Planning

- ❖ Composite, explicit, as-detailed-as-possible planning
- ❖ Collaborative, tacit, just-enough-detail planning

❖ Trust

- ❖ Process Infrastructure
- ❖ Working S/W, Participation

❖ Organization

- ❖ Hierarchical Committees
- ❖ Individuals and teams

❖ Size and scaling

- ❖ Large projects and teams, scaling down difficult
- ❖ Small projects and teams, scaling up largely

❖ Rules

- ❖ Rules are important in both

Comparing CMMI and Agile Characteristics

Technical Characteristics

❖ Architecture

- ❖ Thoughtful, predictive
- ❖ Simple and emergent

❖ Rework

- ❖ Avoid rework, rework costs increase over time
- ❖ Continuous rework, rework costs low and constant

❖ Requirements, Documentation, and Quality Assurance

- ❖ Comprehensive requirements and test documentation; independent test and quality assurance.
- ❖ Customer participation and operational test cases; minimal documentation; team-based defect removal via refactoring

❖ Knowledge management

- ❖ Process Assets
- ❖ People

Comparing CMMI and Agile Characteristics

People Characteristics

- ❖ **Practitioners and advocates**
 - ❖ **Disciplined, Follow Rules and Risk Managers**
 - ❖ **Informal, Creative and Risk Takers**
- ❖ **Skill Level**
 - ❖ **Mix of skills with few experts**
 - ❖ **Multi-skilled with more experts**
- ❖ **Communication**
 - ❖ **Macro, Organizational**
 - ❖ **Micro, Person to Person**
- ❖ **Problem Solving**
 - ❖ **Words and Plans**
 - ❖ **Product and Priorities**

CMMI vs. Agility - The Process Area View

- ❖ Project Planning
- ❖ Project Monitoring and Control
- ❖ Supplier Agreement Management
- ❖ Integrated Project Management
- ❖ Risk Management
- ❖ Integrated Teaming
- ❖ **Quantitative Project Management**
- ❖ Requirements Management
- ❖ Requirements Development
- ❖ Technical Solution
- ❖ Product Integration
- ❖ Verification
- ❖ Validation

KEY {**GREEN** : Complementary, **BLACK**: Neutral, **RED: Rough Edges**}

CMMI vs. Agility - The Process Area View

- ❖ **Organizational Process Focus**
- ❖ Organizational Process Definition
- ❖ **Organizational Training**
- ❖ Organizational Process Performance
- ❖ **Organizational Innovation and Deployment**
- ❖ **Configuration Management**
- ❖ Process and Product Quality Assurance
- ❖ Measurement and Analysis
- ❖ **Decision Analysis and Resolution**
- ❖ **Organizational Environment for Integration**
- ❖ Causal Analysis and Resolution

KEY {GREEN : Complementary, BLACK: Neutral, RED: Rough Edges}

CMMI vs. Agility - The Improvement Path View

❖ “LEVEL 1”

- ❖ Identify scope of work
- ❖ Perform the work

❖ “LEVEL 2”

- ❖ Organizational policy for plan, perform
- ❖ Requirements, objectives and plans
- ❖ Adequate resources
- ❖ Assign responsibility and authority
- ❖ Train the people
- ❖ CM for designated work products
- ❖ Identify and involve stakeholders
- ❖ Monitor and control to plan and take action if needed
- ❖ Objectively monitor adherence to process and QA products/services
- ❖ Review with upper management and resolve issues

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CMMI vs. Agility - The Improvement Path View

❖ “LEVEL 3”

- ❖ Maintain as a defined process
- ❖ ***Measure the process performance to support environment***

❖ “LEVEL 4”

- ❖ ***Establish and maintain quantitative objectives for the process***
- ❖ ***Stabilize the performance of one or more sub-processes to determine its ability to achieve***

❖ “LEVEL 5”

- ❖ **Ensure continuous improvement to support business goals**
- ❖ Identify and correct root causes of defects

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How Higher Process Capability Supports Agility

❖ **Process experience**

- ❖ **Helps decide what process components are critical and which can be removed**
- ❖ **Instinctive use of minimal process with few artifacts while maintaining the required discipline for success**

❖ **Process data**

- ❖ **Understanding the impact of processes**
- ❖ **Estimation mastery and knowing how far you can push the envelope and still survive**

❖ **Process assets**

- ❖ **Encourage reuse and quick startups**
- ❖ **Help maintain and transition knowledge**

Agility and Maturity Level 5:

Agile Practices in Support of CMMI Level 5

Objectives *

- ❖ **Improvements are selected based on an understanding of their expected contribution to achieving the organization's process improvement objectives versus the cost & impact.**
 - ❖ **“Optimizing processes that are agile and innovative depend on the participation of an empowered workforce aligned with the business values and objectives of the organization.” ****
 - ❖ **The organization's ability to rapidly respond to changes is enhanced by finding ways to accelerate and share learning.**
- ❖ **Alternative practices must clearly and unequivocally accomplish a result that meets the goal.**
- ❖ **CMMs enable creativity and improvement within a contextual framework**
 - ❖ **Many CMM practices are informative; providing insight as to what might be done to accomplish expected practices**
 - ❖ **Practitioners should be encouraged to improve the practices that are used to accomplish project and organizational objectives**

* **“Minimizing Unintended Consequences of Process Streamlining,” STC2002, May 2002 presentation, Joe Jarzombek**

** **“Agile Development and the CMMI: Anti-Matter and Matter or Reconcilable Differences?” Presentation at STC, May 2002, Steve Ornburn & David Kane.**

Conclusions

- ❖ Differences are often in approach rather than substance
- ❖ Perceptions (on both sides) are not necessarily valid
- ❖ “Liberal” interpretation of CMMI generally consistent with agile
 - ❖ Organizational facets of CMMI are most “out of synch”
 - ❖ Levels 3 and 4 are most problematic because they tend to be most process-centric
- ❖ Communication will help reconcile differences

